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Airborne Systems Software Acquisition Engineering Guidebook for STATEMENTS OF WORK AND REQUESTS FOR PROPOSAL

SEPTEMBER 1978

PREPARED FOR
DEPUTY FOR ENGINEERING
AERONAUTICAL SYSTEMS DIVISION
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This report is one of a series of guidebooks which provide guidance to the acquisition management and engineering of Airborne Systems software procured under Air Force 800 series regulations. It describes the structure and functions of the SOW and RFP and provides methods for preparation.

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PREFACE

This guidebook is one of a series of guidebooks intended to assist the Air Force Program Office and engineering personnel in software acquisition engineering for airborne systems. The contents of the guidebooks will be revised periodically to reflect changes in software acquisition policies and practices and feedback from users.

This guidebook has been prepared under the direction of the Aeronautical Systems Division (ASD), Deputy for Engineering (EN), in coordination with the Space and Missile Systems Organization (SAMSO), AirForce Systems Command (AFSC).

The series of Software Acquisition Engineering Guidebooks (Air-Borne Systems) is currently planned to cover the following topics:

Available Guidebooks

- Regulations, Specifications and Standards, ASD-TR-78-6; ADA058428
- Software Quality Assurance, ASD-TR-78-8; ADA059068
- Reviews and Audits, ASD-TR-78-7; ADA058429
- Statements of Work and Requists for Proposal, ASD-TR-79-5026
- Configuration Management, ASD-TR-79-5024
- Computer Program Documentation Requirements, ASD-TR-79-5025

Planned Guidebooks

- Verification, Validation and Certification ASD-TR-79-5028
- Requirements Analysis and Specification ASD-TR-79-5027
- Software Cost Analysis and Estimating
- Contracting for Software Acquisition
- SAE Guidebooks - Application and Use
- Computer Program Maintenance
- Software Development Planning and Control
- Software Testing and Evaluation
- Microprocessors and Firmware
- Software Development and Support Facilities

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ABBREVIATIONS AND ACRONYMS

AFCMD	Air Force Contract Management Division
AFLC	Air Force Logistics Command
AFR	Air Force Regulation
AFSC	Air Force Systems Command
ASD	Aeronautical Systems Division AFSC
ASPR	Armed Services Procurement Regulation
ATC	Air Training Command
CBD	Commerce Business Daily
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CI	Configuration Item
CLI	Contract Line Item
CLIN	Contract Line Item Number
CM	Configuration Management
CPC	Computer Program Component
CPCI	Computer Program Configuration Item
CPDP	Computer Program Development Plan
CPFF	Cost Plus Fixed Fee
CPIF	Cost Plus Incentive Fee
CRISP	Computer Resources Integrated Support Plan
CWBS	Contract WBS
D&F	Determinations and Findings
DCAS	Defense Contract Administration Services

ABBREVIATIONS AND ACRONYMS
(Continued)

DCP	Decision Coordinating Paper
DD, DOD	Department of Defense
DDC	Defense Documentation Center
DID	Data Item Description
DMO	Data Management Officer
DRFP	Draft RFP
DSARC	Defense System Acquisition Review Council
ECP	Engineering Change Proposal
ESD	Electronic Systems Division AFSC
FCA	Functional Configuration Audit
F.O.B.	Freight on Board
FQT	Formal Qualification Testing
FSED	Full-Scale Engineering Development
GFE	Government Furnished Equipment
GFP	Government Furnished Property
HOL	High Order Language
IAW	In Accordance With
ICS	Interpretive Computer Simulation
IFPP	Instructions for Proposal Preparation
MENS	Mission Element Need Statement
NSCCA	Nuclear Safety Cross-Check Analysis
OPR	Office of Primary Responsibility
PATE	Performance Analysis and Technical Evaluation
PBC	Program Breakdown Structure Code
PBS	Program Breakdown Structure

ABBREVIATIONS AND ACRONYMS
(Continued)

PCA	Physical Configuration Audit
PCO	Procuring Contracting Officer
PDR	Preliminary Design Review
PEP	Procurement Evaluation Panel
PMD	Program Management Directive
PMP	Program Management Plan
PO	Program Office
PP	Procurement Plan
PWBS	Program Summary WBS
QA	Quality Assurance
RAD	Requirements Authorization Directive
RFP	Request for Proposal
ROC	Required Operational Capability
RSS	Regulations, Specifications, and Standards
SAMSO	Space and Missile Systems Organization (Division) AFSC
SCN	Specification Change Notice
SE/TD	Systems Engineering and Technical Direction
SOW	Statement of Work
SSA	Source Selection Authority
SSAC	Source Selection Advisory Council
SSEB	Source Selection Evaluation Board
SSP	Source Selection Plan
T&E	Test and Evaluation
TEMP	Test and Evaluation Master Plan
TEOA	Test and Evaluation Objectives Annex to PMD

ABBREVIATIONS AND ACRONYMS
(Concluded)

UCF	Uniform Contract Format
UDID	Unique DID
V&V	Verification and Validation
VV&C	Verification, Validation and Certification
VDD	Version Description Document
WBS	Work Breakdown Structure

1. INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this guidebook is to provide Air Force Program Office engineering and management personnel with information that will help them prepare Requests for Proposal (RFP's) for acquisition of software embedded in weapon systems. While this guidebook is oriented primarily toward procurements required under AFR 70-15 and AFR 800-2, its concepts and procedures, appropriately tailored, are recommended for lower-dollar and less complex procurements.

This guidebook describes the structure and function of the Statement of Work (SOW) and RFP with special emphasis on software acquisition under the AFR 800-series of Air Force regulations (See Section 4.1 of the Regulations, Specifications, and Standards (RSS) Guidebook). It provides methods for defining the elements of a SOW and a method of organizing them. This guidebook also presents methods for RFP preparation with emphasis on making it a clear, concise, communicative instrument for expressing the requirements to the prospective software developer. Preparation of the Statement of Work (SOW) portion of the RFP is given special attention.

The SOW/RFP preparation is presented in context with the procurement process as summarized below:

1. Identification of an acquisition through the system acquisition planning process.

2. Appointment of a working level manager responsible for the entire source selection and formation of a team by appropriate disciplines to refine the planning and develop an RFP.

3. Establishment of milestones for the acquisition. One of the first milestones is formation of a Business Strategy Panel (See AFSCR 70-2).

4. Division of the team by the working level manager into areas of expertise, with "team chiefs" responsible for the Technical, Management, and Cost sections of the RFP. This manager must coordinate the development of each of the RFP sections to ensure source selection

milestones are met. He must support each team chief in obtaining key team members for the various disciplines. For example, the Technical Area Chief will need assistance in his areas of responsibility, such as the specifications, SOW, CDRL, proposal preparation instructions, evaluation factors for award, and the program office independent cost estimate. The following staff personnel support the Team Chiefs. A Data Manager would go through a Data Call and develop a Contract Data Requirements List (CDRL). Financial personnel would help develop independent cost estimates. Procurement personnel would oversee business considerations, develop special provisions, etc.

5. Production of a Draft RFP, following several iterations of the team's efforts, for release to industry for comment.

6. Incorporation of industry comments to the DRFP and submittal of RFP including Sections A through M of the Uniform Contract Format (UCF) to a Procurement Evaluation Panel (Murder Board; see AFSCR 70-7).

7. Incorporation of Murder Board comments.

8. Release of the RFP to the procurement staff for final release approval.

9. Receipt and evaluation of proposals and award of contracts in accordance with AFR 70-15.

Procurements under the AFR 300-series of Air Force regulations is briefly discussed in Section 4.2 of the RSS Guidebook.

1.2 CONTEXT OF RFP AND SOW

1.2.1 RFP/SOW Within the System Life Cycle

The RFP is one of the most important documents in the acquisition cycle. All of the preparation and planning for a procurement goes into the RFP as the key communication to potential contractors on exactly what, how, and when the Government needs to buy. If the RFP does not fulfill this primary purpose - communication - the best planning may be upset. The basic message is elementary - the RFP must be complete, concise and a clear communication of Government requirements.

An RFP is used to solicit proposals for required supplies and services from industry. A good contract provides for a fair exchange by the contractor and the Government of something of value by each part.

It must accurately reflect a "meeting of minds." Thus the contract must include a proper definition and description of what is to be exchanged, and how the exchange will be effected. A clear, concise, and complete RFP that will foster meaningful negotiations is the basis for the contract. Anything less makes a good contract difficult to achieve.

The RFP must be organized and prepared in four parts in accordance with ASPR 3-501. RFP Part I (Sections A through D) is not included in the contract. It is in the RFP to provide instructions for proposal preparation. RFP Parts II, III and IV (Sections E through M) along with RFP Attachments and Exhibits (if used) are included in the contract after possible change during contract negotiations. A top level view of the typical contract structure for deliverable computer programs is shown in Figure 1-1.

Other parts of the RFP of particular software relevance are the delivery schedule (Section H), inspection and acceptance (Section I), special provisions (Section J), general provisions (Section L), the Contract Data Requirements List (attachment or exhibit) and the specifications (attachments).

RFPs for different development phases in the Major Defense System Acquisition Life Cycle have few variations except in the firmness of the specifications included in the RFP. Table 1-1 indicates the progressive strengthening of major RFP-included specifications through the acquisition life cycle. See Section 5.4.3.1.

Section 4.1 below presents, for the weapon system life cycle, the phase-related guidelines for SOW/RFP preparation. Generally, contracts are written for one phase. Options for follow-ons should not be binding so that the Air Force could drop a contractor after the first phase because of poor performance. Phase 2 may be included in the bid package to: 1) minimize cost and schedule impacts caused by changing contractors, and 2) obtain cost estimates to support program reviews for the next life cycle phases.

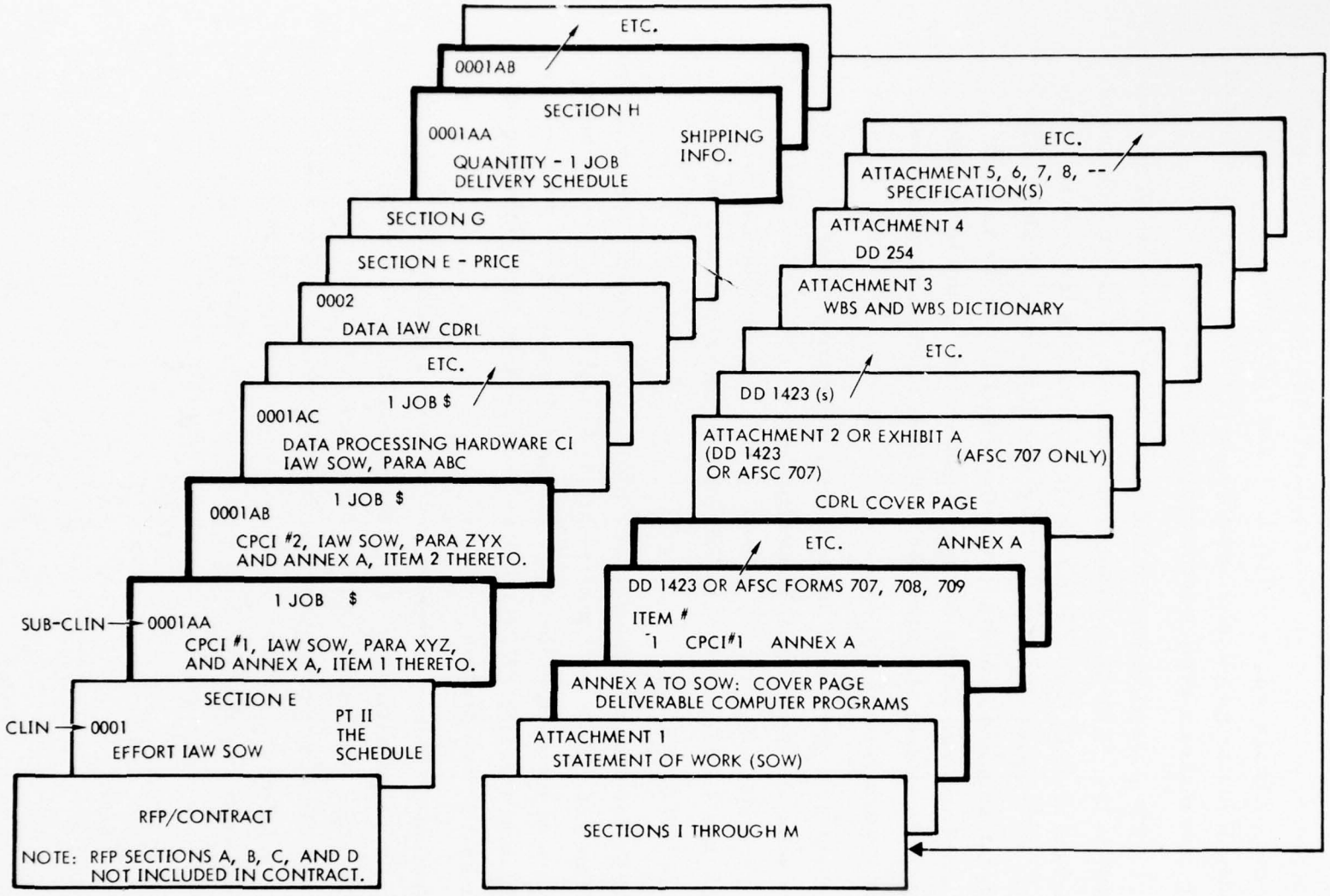

Figure 1-1. Contract Structure for Deliverable Computer Programs

Table 1-1. Typical Specifications Included in the RFP for each Acquisition Phase

Specifications	Conceptual Phase	Validation Phase	Full-Scale Engineering Development Phase	Production and Deployment Phases
System Requirements Documents	X			
Initial System Spec		X		
Authenticated System Spec			X	X
Technical Requirements Document for the CPCI	X			
CPCI Preliminary Part I Spec		X		
CPCI Part I Spec			X	X
CPCI Part II Spec				X

1.2.2 RFP/SOW Within the Guidebook Series

This guidebook addresses the following guidebooks in specifying and contracting for the work to be done:

- "Regulations, Specification, and Standards" (RSS) for 1) government requirements on RFP/SOW preparation, 2) use of RSS documents as compliance documents, and 3) defining CDRL items;
- "Software Quality Assurance" for guidelines in imposing QA requirements in the SOW;

- "Reviews and Audits" for definition and incorporation of development Milestones;

- "Contracting for Software Acquisition" for 1) determining the type of contract and options, 2) developing evaluation factors for contract award, and 3) consummating the RFP/SOW package into a contract;

- "Verification, Validation and Certification" for development of related CDRL items;

- "Configuration Management" (CM) for preparation of the SOW task on CM;

- "Requirements Analysis and Specification" for developing the software specification; and "Computer Program Documentation" for determining the deliverable documentation via the CDRL.

1.3 CONTENTS OF THE GUIDEBOOK

This guidebook contains the following parts:

- Section 1, Introduction. This section contains the purpose and scope of this guidebook, states the general functions of the RFP and SOW and outlines the content of this guidebook.

- Section 2, Applicable Documents. This section references documents relevant to RFP and SOW preparation.

- Section 3, Guidelines for SOW Preparation. This section discusses general guidelines, SOW organization, planning of SOW preparation task, WBS, SOW composition, data management, a SOW writer's checklist and SOW development steps.

- Section 4, SOW Phase and Discipline Specific Guidelines. This section discusses the SOW related to the acquisition life cycle, types of SOW tasks, and variables affecting the SOW content.

- Section 5, Guidelines for RFP Preparation. This section discusses responsibilities, RFP organization, events and schedules, and RFP content with emphasis on software-related items.

Maximum use of references is made since it keeps the guidebook current as the references are modified.

2. REFERENCE DOCUMENTS

The Software Acquisition Engineering Guidebook on Regulations, Specifications and Standards lists and provides abstracts of all current government documents which specify or provide additional guidance on Statements of Work and Requests for Proposal and related disciplines. The primary documents which are particularly relevant are:

1. DOD 5000.19-L, Vol II	Acquisition Management Systems and Data Requirements Control List
2. DODD 5000.1	Major System Acquisitions
3. DODD 5000.2	Major System Acquisition Process
4. DODD 5000.29	Management of Computer Resources in Major Defense Systems
5. MIL-S-52779 (AD)	Software Quality Assurance Program Requirements
6. MIL-S-83490	Specifications, Types and Forms
7. MIL-STD-480‡	Configuration Control - Engineering Changes, Deviations and Waivers
8. MIL-STD-481	Configuration Control - Engineering Changes, Deviations and Waivers (Short Form)
9. MIL-STD-482A	Configuration Status Accounting Data Elements and Related Features
10. MIL-STD-483 (USAF)	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs
11. MIL-STD-490	Specification Practices
12. MIL-STD-881A	Work Breakdown Structures for Defense Materiel Items

‡MIL-STD-480 is expected to be replaced by DOD-STD-480A.

13.	MIL-STD-1521A (USAF)	Technical Reviews and Audits for Systems, Equipment, and Computer Programs
14.	AFR 70-15	Source Selection Policy
15.	AFR 122-9	The Nuclear Safety Crosscheck Analysis and Certification Program for Weapon Systems Software
16.	AFR 122-10	Nuclear Weapon Systems Safety Design and Evaluation Criteria
17.	AFR 300-10	Computer Programming Languages
18.	AFR 310-1	Management of Contractor Data
19.	AFR 800-2	Acquisition Management - Program Management
20.	AFR 800-14, Vol I	Management of Computer Resources in Systems
21.	AFR 800-14, Vol II	Acquisition and Support Procedures for Computer Resources in Systems
22.	AFR 800-25	Specification and Standards Application
23.	AFSCR 70-2	AFSC Business Strategy Panel
24.	AFSCR 70-7	Procurement Evaluation Panel
25.	AFSCR 80-15	R&D Source Selection Policy and Guidance
26.	AFSCR 310-1	Management of Contractor Data
27.	AFSCR 310-2	Deferred Requisitioning of Engineering Data
28.	AFSCM 173-4	Program Breakdown Structures and Codes
29.	AFSCP 70-4[†]	Request for Proposal Preparation Guide
30.	AFSCP 800-3	A Guide to Program Management

[†] In the preparation of this guidebook, extensive information has been obtained from these documents.

31. AFSCP 800-6†	Acquisition Management - Statement of Work Preparation Guide
32. SAMSOR 70-2†	Request for Proposal Policy
33. SAMSOP 800-6†	Acquisition Management - Statement of Work Preparation
34. SAMSO-STD-73-3	Standard Engineering Practices for Computer Software Design and Development
35. MTR-3194†	An Air Force Guide to Software-Related SOW Preparation by the MITRE Corp.
36. ASPR	Armed Services Procurement Regulations

†In the preparation of this guidebook, extensive information has been obtained from these documents.

3. GUIDELINES FOR SOW PREPARATION

3.1 GENERAL

The SOW is an amplification of Section E of both the RFP and the contract. It is prepared when the task requirements and related information are too lengthy to be conveniently written into Section E. The SOW is included as an attachment to both the RFP and the contract.

The SOW describes the work which the Government wants accomplished by the contractor, identifies the products of each task, relies on the Contract Data Requirements List (CDRL) to establish form, content and delivery requirements for data, and is consistent with both the preliminary Contract Work Breakdown Structure (CWBS) and the program objectives identified in the Program Management Directive. Responsibilities for SOW preparation are contained in AFSCP 800-6. This guidebook interprets these objectives, states general requirements for SOW preparation, and suggests actions helpful to the preparation of a good SOW.

3.2 SOW ORGANIZATION

The SOW is organized differently depending on the acquisition phase and type of effort. These formats are presented in AFSCP 800-6, Chapters 3 through 8. Section 4 presents some SOW variations with phases. A typical full-scale engineering development (FSED) phase SOW outline is shown in Figure 3-1.

3.3 GETTING STARTED

The SOW must be consistent with the requirements levied on offerors in other parts of the RFP, such as Sections C, D, the CDRL, and the specifications. Therefore, the team that prepares the SOW will work on these other sections as well. This manager must coordinate the development of each of the RFP sections to ensure source selection milestones are met.

While it is impractical to attempt to provide guidance covering all eventualities in preparation of SOW's, the succeeding paragraphs will provide general guidance on how to begin. The person assigned the

1. SCOPE AND OBJECTIVES

2. GENERAL BACKGROUND
(information, constraints, and reference documents)

3. CONTRACTOR TASKS

- 3.1 COMPLIANCE DOCUMENTS
- 3.2 DESIGN AND DEVELOPMENT OF SYSTEM
- 3.3 TRAINING
- 3.4 DESIGN AND DEVELOPMENT OF OPERATIONAL SUPPORT EQUIPMENT
- 3.5 DESIGN, DEVELOPMENT, TEST AND EVALUATION OF PECULIAR SUPPORT EQUIPMENT
- 3.6 SYSTEM TEST AND EVALUATION
- 3.7 SYSTEM/PROJECT MANAGEMENT
- 3.8 OVERALL DATA REQUIREMENTS
(Technical Orders, Manuals, and Management Data)
- 3.9 OPERATIONAL/SITE ACTIVATION

4. SPECIAL CONSIDERATIONS

ANNEX TO SOW

1. COMPUTER PROGRAMMING PRODUCTS
(e.g., DI-E-30145)

Figure 3-1. Typical FSED Phase SOW Outline

responsibility for preparing a SOW should follow these steps to get started:

- Step 1. Review the requirement and directive documents which authorized the program and defined its basic objectives, e.g., PMD, PMP, DCP, APP, ROC.

- Step 2. Review the Air Force and AFSC regulations, policy directives, etc., which apply to the type of procurement under consideration. Prepare a bibliography citing the regulatory material which should be used in preparing the SOW.

- Step 3. Obtain copies of the preliminary system specification or lower level specifications, or similar technical requirements documents to be referenced in the SOW.

- Step 4. Obtain copies of the Program Breakdown Structure (PBS) derived from the attachments in AFSCM 173-4. Assist in expanding the PBS to lower levels commensurate with contract management requirements of the program office. This expanded structure then serves as the baseline for preparation of SOW's and the preliminary CWBS to be included in the RFP/contract.

- Step 5. Prepare a detailed checklist, listing the items and the selected optional parts of the individual SOW.

- Step 6. Research and prepare rough draft (top down) outline of various tasks, including required attachments and expected compliance specifications. Obtain samples of similar SOW's, annexes, and compliance specifications and discuss with persons familiar with these to reveal any problems experienced with them.

- Step 7. Require preliminary cost estimates (in terms of manning required) for each task in coordination with the local cost analysis activity. Review of these estimates permits early trade-off considerations on the desirability of efforts which do not address specified technical objectives or which tend to exceed the available budget.

- Step 8. Establish schedules for preparation of the coordinated rough draft SOW "fragments". Coordinate with comparable schedules for preparing compliance specifications and the procurement schedules.

3.4 ORGANIZING AND PRODUCING THE SOW AND RELATED DOCUMENTS

Prior to producing the SOW, a security classification guide and a work breakdown structure should be developed for use in classifying and organizing the SOW. Furthermore, a Contract Data Requirements List must be prepared in parallel with the SOW. Because of their importance, these documents are discussed briefly in Sections 3.4.1, 3.4.2 and 3.4.4. These documents are usually included in the RFP as attachments. See Section 5.4.3.

3.4.1 Security

A DD Form 254, Contract Security Classification Specification, may be developed for procurement actions, based on the specific content

of the SOW measured against the master security classification guide for the individual program. The SOW writer should include in the SOW any security constraints or international aspects that will have a significant effect on performance of the work being called for.

3.4.2 Work Breakdown Structure (WBS)

A WBS is a product-oriented tree-structured representation of the hardware, software, services and data that comprise an acquisition. A WBS depicts the chief order in which these tasks and products will be broken out for purposes of cost accounting. The single highest level WBS Element represents the overall system being developed. The second-level Elements represent major parts of the system. MIL-STD-881A establishes uniformity within the upper three levels of summary Work Breakdown Structures of defense materiel items for use during the acquisition phase of a program or project. DOD components are responsible for uniformly expanding the summary structures. This expansion results in the Program Breakdown Structure (PBS). For this expanded PBS, a coding system (PBS/C) was developed to identify and index each element into its proper position or level within the summary structure. For AFSC, this is defined in AFSCM 173-4. This code is also used to identify and index individual Contract Work Breakdown Structure (CWBS) elements as subdivision of the PBS.

3.4.2.1 WBS Software Elements

The WBS permits a logical arrangement of the elements of the SOW, a tracing of work effort expended under each of these elements, and easy identification of the Computer Program Configuration Items (CPCI's).

To collect sound software cost data as a basis for future software cost estimates, software development cost data should be accumulated separately for each CPCI to be developed under the contract. It is desirable to identify the computational system in the WBS at a Level 3 to assure adequate cost reporting of software data by the contractor. MIL-STD-881A permits this for electronic systems but not for aircraft, missile or space systems. Until this is changed, a Level 4 or 5 element,

as permitted by AFSCM-173-4, should be used, since the computational system and software may be Contract Line Items (CLI) and the contractor must submit separate data for each CLI. (See Section 5.4.2.1, below). For example, Guidance and Control Equipment (Level 3) may have a Guidance Set (Level 4) which may have a Guidance Computer (Level 5), a Bulk Store Memory (Level 5), a Ground Control Computer Program (Level 5), and an In-Flight Computer Program (Level 5). Where comparable emphasis is required for software task versus hardware task, tailor MIL-STD-881A to reflect that emphasis and place proper management attention on software task during its performance (e.g., tailor MIL-STD-881A to move a Level 4 or 5 element to Level 3).

3.4.2.2 Relationship to Statement of Work

While a Contract WBS (CWBS) must be compatible with the Program Breakdown Structure, the CWBS may include details which are identified as shredouts of PBS elements. All tasks specified in the SOW should be grouped according to pertinent PBS elements and priced contract line items. Levels of detail below PBS may be outlined in SOW structuring to clarify interrelationships.

3.4.2.3 General SOW Preparation Requirements

The practices stated below apply generally to SOW's for Validation Phase and Full-Scale Engineering Development Phase contracts.

3.4.2.3.1 SOW Paragraph Correspondence to Preliminary CWBS Elements. A separate SOW paragraph may be prepared corresponding to each Preliminary CWBS Element. As a result, a SOW may also have a hierarchical structure like a WBS. A SOW will normally define tasks in greater detail than the lowest level Preliminary CWBS Elements. These subparagraphs may be nested to any depth.

3.4.2.3.2 SOW Paragraph and CLI Correspondence. At and above some level, the SOW paragraphs may correspond to the CLI's (see Section 5.4.2.1 below). This correspondence is assured if the Preliminary CWBS is properly structured before the SOW is prepared.

3.4.2.3.3 SOW Incorporation of PBC's. Each Validation Phase or Full-Scale Development Phase SOW paragraph should identify or be

identified by the Program Breakdown Codes (PBC) of the Preliminary CWBS Element to which it corresponds. PBC's may be used in addition to, or in lieu of, normal SOW paragraph numbers.

3.4.3 SOW Format and Composition

The program office will select an appropriate SOW format from the SAMPLES provided in AFSCP 800-6; however, the selected format should be tailored to meet the specific program objectives. A typical format is presented in Section 3.2 above.

3.4.3.1 General Guidance

General guidelines are as follows:

1. Statements of Work should be written in clear, concise language which will be easily understood by the contractor. The importance of well written SOW's cannot be over-emphasized since they express the requirements of the Air Force. Misunderstanding can be a significant factor in contract negotiation and contractor performance.

2. Contractor tasks and technical requirements should be included in the Contractor Tasks section of the SOW. The major task breakdown should be compatible with the effort described in the Objective and Scope section of the SOW. Task descriptions should clearly state what is required of the contractor and what results are expected. When a lengthy detailed description of a technical task/requirement is necessary, it may be more feasible to prepare a compliance document.

3. Deliverable reports and data generated during contract performance are listed in the Contract Data Requirements List (CDRL/DD Form 1423, see Section 3.4.4.1). The CDRL is included as a line item in the contract (not the same line item used for the SOW, see Sections 5.4.2 and 5.4.3).

4. Clauses and provisions are included in the Special and General Provisions of the RFP (see Sections 5.4.2.5 and 5.4.2.7, below) and should not be repeated in the SOW.

3.4.3.2 Content

Contents of an effective SOW are listed below.

1. Table of Contents. Every Statement of Work that exceeds two pages should have a table of contents that is readily correlatable with the established preliminary Contract Work Breakdown Structure.

2. Scope and Objectives. Every Statement of Work will include introductory paragraphs which should present a clear description and understanding of the overall scope and objectives. Work outside the Scope may involve lengthy procurement lead time since change orders may not be used. Therefore, Scope should clearly identify the major elements of the work required and the end result desired or the product of the effort. The manner in which Scope is defined will also govern the amount of direction that the government can give and that the contractor will accept during the contract's life.

3. General Background. This SOW section should provide background information such as a brief history, the efforts' relationship to other procurements, technology to be used or not used (if appropriate) and a list of reference documents. Software related references include: the weapon system specification, Standard PBS/PBC document, and Software Design Standards.

4. Contractor Tasks. This SOW section should provide detailed descriptions of the studies and analyses to be performed, the services to be provided, the items of equipment and software to be delivered, and the management systems to be employed; it should also provide reference to applicable compliance documents and CDRL sequence numbers.

   It is important to note that SOW's are not generally organized such that software items are conveniently grouped together. For example, in the sample FSED SOW organization in Figure 3-1, Sections 3.2 through 3.8 are typical WBS Level 2 items. Each of these probably contain hardware and software related tasks. The task "Design and Development of System" will be further divided and subdivided until (as mentioned in Section 3.4.2.1 of this guidebook) the operational software for the system is addressed as (multiple) Level 5 task elements.

   This section will typically require development of software related items such as: operational software; support software (compiler, assembler, linkage editor, etc.); development, test, and integration hardware facilities and related software; computer program loader-verifier; system test and integration software; and, occasionally, CPCI qualification test software.

   It may also require typical software related studies and analysis (particularly if a validation or competitive prototype system SOW is being prepared) such as: hardware/software/man-machine and computer system architecture tradeoffs, hard-wired versus programmable digital processing tradeoffs, computer memory allocation, data base design studies, programming practices, performance analysis of alternate sets of equations, cost effectiveness of HOL (AFR 300-10)

versus assembly language, compiler effectiveness, and software design optimization. See also the guidebook on Requirements Analysis and Specifications.

Typical software related compliance documents which are referenced in this section of the SOW are: System, System Segment or Prime Item Development Specifications, Program technical requirements documents, preliminary CPCI Part I Specification, MIL-STD 480, MIL-STD 481/2A, MIL-STD 483 appendices II, VI, VIII, XIV, MIL-STD 1521A.

See Section 4.2 below for additional SOW tasks.

5. Special Considerations. This SOW section should address special instructions not directly related to the contractor tasks, e.g., management meetings and liaison with the government and associate contractors.

3.4.3.3 Requirements

Describe the requirements in terms of performance in complete detail, whether by direct statements or reference to other documents, such as specifications and standards. Normally, specifications and standards are compliance documents and are therefore binding requirements. Do not cite a compliance document in its entirety unless all of the provisions are required. Tailoring to minimum needs is mandatory. Identify specific exceptions or the specific applicable requirements of a compliance document in the appropriate SOW task on Compliance Documents. The requirements of a compliance document may be expanded by including appropriate description in an annex to the SOW. Guidelines for using and tailoring a compliance document are presented with examples in the RSS Guidebook, Section 5.4.1 and in SAMSOP 800-6. AFR 800-25 provides additional guidance and information. Each tailored compliance document may be assigned its own SOW paragraph number for referencing by SOW tasks. The SOW must indicate the applicability of each compliance document, either in the tailored application or the SOW task that requires the document. Specific and appropriate references to the specifications, military specifications, and military standards are essential to clear, precise, and appropriate SOW task descriptions and Data Item Definitions.

Do not cite Regulation documents for compliance except where the contractor is required to accomplish tasks normally performed by the government - such as operation and maintenance contracts. Do not cite other government documents such as manuals, handbooks, pamphlets, etc., for compliance.

3.4.3.4 Procedures

When immediate decisions cannot be made, it is usually possible to include a procedure for making them. It can be merely a statement such as "as approved by the contracting officer" or "at the contractor's discretion" or "the contractor submits this report each time a Category B failure occurs."

3.4.3.5 Language

The writer should be aware that SOW's often have to be read and interpreted by persons of varied backgrounds. Therefore, the SOW should be worded to make more than one interpretation virtually impossible. Careful and exact descriptions will avoid misunderstandings during the life of the contract. Some things to bear in mind when writing are included below:

1. Use active rather than passive voice. Say "The contractor shall conduct a test" rather than "A test shall be conducted.".

2. Do not use open ended phrases such as "but not limited to..."

3. Use "shall" to stipulate mandatory provisions. Use "should" to designate a preferred item or practice and "may" to designate an acceptable item or practice. Use "will" to designate a declaration of intent on the part of the Government. "Will" may also be used when it is necessary to designate simple futurity, for example, "Power for the equipment will be provided by the existing ground stations."

4. The contract imposes rights and obligations on both parties. If it doesn't say "it" in the contract, "it" is out of scope. That means if you want "it" done, you will need a contract modification that may change cost, schedule or performance.

5. Limit abbreviations to those in common usage. In any case, the first time an abbreviation is used, give the item's title and follow that with the abbreviation in parentheses.

3.4.3.6 Specific Purpose

Keep the specific purpose in mind and eliminate meaningless jargon from SOW's. State what results are required, not how the contractor is to do the job nor what you think he will need. Describe fully what is required to satisfy the contract. The following questions can be used to judge whether material should be in an SOW:

1. Is it necessary in order to accomplish the effort?
2. Does it tell the contractor what he is required to do?
3. Is it necessary in order for the contractor to determine what is required of him?
4. Is there a method to determine when the basic task is complete (i.e., is it priceable)?

Material or tasks that do not pass these tests should generally be redefined or left out of the SOW.

3.4.4 Data Management

3.4.4.1 Relationship of RFP/SOW to CDRL

The Contract Data Requirements List (CDRL) is a list of data requirements that is authorized for a specific procurement. This list is prepared on the DD Form 1423, "Contract Data Requirements List," or its mechanized equivalent (AFSC Forms 707, 708, 709). The CDRL is established as an alternative to setting forth an extensive listing of line or subline items in Section E of the Contract Schedule. The CDRL or its mechanized equivalent is included in the RFP as either an exhibit or an attachment to the contract.

As used here, the term "data" includes all administrative, management, financial, scientific, engineering, and logistic information and documentation which are acquired for delivery or deferred delivery (AFSCR 310-2) from Air Force contractors.

Preparation of the CDRL should be a coordinated effort between the SOW Project Officer and the Program Office's Data Management Officer (DMO). Planning for data requirements should be considered in the early phases of the SOW effort. Do not include data preparation

instructions in the SOW tasks. When the effort described in a SOW task results in the generation of data, the task should not directly address the preparation or delivery of the data. It may however, reference the data resulting from the effort to the appropriate CDRL sequence item number, that is, "CDRL XXXX," preferably at the end of the task. The CDRL (DD Form 1423) must reference the SOW paragraph number or PBC. Both the SOW and the CDRL must identify the Data Item by the same name. Cut costs by using one CDRL entry rather than several, when possible, e.g., study reports.

3.4.4.2 CDRL Entry

Each Data Item (i.e., each document and each computer storage media containing a software CI) to be delivered under the planned contract must be identified in a CDRL entry. For CPCI technical data, the CDRL must define the Data Item (by DID reference) and the terms and frequency of delivery. The software media related CDRL (i.e., DI-E-30145 or A30008/M) must not specify delivery requirements. Instead it must reference the Delivery Schedule. Since the software media is an end item, delivery of each item is called for in a Contract Line Item. The media CDRL should be separated from the technical data CDRL. A method for doing this is shown in Figure 1-1.

Each CDRL entry also includes blank fields for contractor estimates of Data Item size and price. For CDRL entries relating to technical data associated with software the contractor's proposal must provide this information. (Usually, RFP Section C states that a proposal that lacks these price estimates may be rejected as non-responsive). Cost/price data related to the media CDRL is inappropriate, since these prices are priced against the Contract Line Item calling for the software development.

3.4.4.3 Completion Dates and Periods of Performance

Each SOW paragraph that defines a task must have an appropriate completion date or Period of Performance for that task. The SOW must not specify delivery dates for Data Items; these must be CDRL-defined. A task completion date or Period of Performance may be included explicitly in the SOW paragraph that prescribes the corresponding task. However, it is normally preferable to include task completion dates and

Periods of Performance in the Delivery Schedule (RFP/contract Section H, see Section 5.4.2.3, below) and to refer to the Delivery Schedule in the SOW paragraphs. The recommended approach concentrates all date-related SOW requirements, which simplifies their updating and cross-checking for feasibility.

3.4.4.4 Policies and Procedures

AFSCR 310-1 provides policies and procedures for:

- Preparing DD Form 1423, Contract Data Requirements List, which becomes a contract attachment or exhibit, and governs the delivery of all data, other than ASPR requirements in the general or special contract provisions.
- Using DOD standard DD Form 1664, Data Item Descriptions, which are contractually incorporated by reference on DD Form 1423. Already approved DID's listed in DOD 5000.19-L, Vol II should be used whenever possible.
- Developing, approving, and using program peculiar, or unique, data requirements as well as modifications to capitalize upon contractor internal data in relaxed format.

3.4.4.5 Software DID's

Major documents for monitoring contractor performance are usually contractor prepared and are used for configuration management, engineering, test system operation, and support. These documents are associated with the computer program life cycle as presented in the Documentation Guidebook in this series.

The DOD authorized data list identifies standard data item descriptions (DID's) for use in acquiring data from contractors. Examples of DID's applicable to computer resource data requirements are shown in Table 3-1. Care should be taken to tailor the DID's to actual requirements.

Wherever a modified DID prescribes a CDRL entry's form and content, the DID identification must indicate this (e.g., by appending "/M" to the DI number). The modifications themselves must be stated in the CDRL entry itself, or on backup sheets attached to the CDRL entries, or on the modified DID form (DD Form 1664) which may be included as an annex to the CDRL. Besides the CDRL entries and backup

Table 3-1. AF DID's Applicable to Software Acquisition

DID Identifier	Data Item Name	Guidance	Comments
ADMINISTRATIVE/MANAGEMENT			
* †	CRISP	800-14 Vol II	Prepared by CRWG (Computer Resources Working Group)
A-3002	R&D Status Report		
A-3007	Program Schedule		
A-3009	Program Milestones		
A-3022	Contract Data Management Plan		
A-3027†	Data Accession List		Contractor internal data
A-3029†	Agenda-Design Reviews, Configuration Audits, Demonstrations	1521A	SRR, SDR, PDR, CDR, FCA, PCA
A-30008/M	Computer Programs; Data and Printouts		
ENGINEERING AND CONFIGURATION MANAGEMENT			
E-3101†	System (Segment) Specification	483, App. 3	
E-3104	Addendum Specification	483, App. 4	To Part I or Part II
E-3107	Installation Completion Notification	483, App. 15	Change implementation
E-3108	Configuration Management Plan	483, App. 1	
E-3114	System Mod. Design Data and Reports		Basis for modifications
E-3116	System Allocation Document	483, App. 11	
E-3117	Segment Specification (Modification program)	483, App. 3	
E-3118†	Minutes of Reviews and Audits	1521A	SRR, SDR, PDR, CDR, FCA, PCA
E-3119A†	Computer Program Development Specification	483, App. 6	Part I
E-3120A†	Computer Program Product Specification	483, App. 6	Part II (includes flow charts)
E-3121	Version Description Document	483, App. 8	Version release
E-3122†	Configuration Index (Computer program)	483, App. 8	Approved changes
E-3123	Change Status Report (Computer program)	483, App. 8	Proposed changes.
E-3127	Advance Change/Study Notice	480	
E-3128†	Engineering Change Proposal (ECP)	483, App. 14	(Related to SCN)
E-3129	Request for Deviation/Waiver	480	
E-3134†	Specification Change Notice (SCN) (Computer Programs)	483, App. 8	(Related to ECP)
E-3145	Engineering Drawing for Reviews, etc. (Interface Control Drawings)	483, App. 2	
E-3126A	Request for Nomenclature		
E-30145	Computer Software/Computer Program/ Computer Data Base Configuration Item(s)	483, App. 6	Preparation Requirements
HUMAN FACTORS			
H-3251	Personnel Subsystem/Human Factors Plan		
H-3258A	Training Support Data		In place of manuals
H-3261A	Human Engineering Design Approach		
H-3267	Evaluation Needs/Exercise Requirements		Input to software requirements
H-7012	Operator/Critical Tasks Analysis		Requirements and Documentation
H-3269A	Training Needs/Exercise Requirements		Input to software requirements
H-3272	Personnel Subsystem Test and Evaluation Plan		

† Part of minimum software documentation set.

* This data item is not contractor-developed.

Table 3-1. AF DID's Applicable to Software Acquisition (Concluded)

DID Identifier	Data Item Name	Guidance	Comments
TECHNICAL PUBLICATIONS			
M-3401	T.O. Publication Plan		Proposing user documentation
M-3402	T.O. Status and Schedules		Documentation status
M-3409*	Positional Handbook		
M-3410*	User's Manual		For all programs delivered
M-3411	Computer Programming Manual		
M-3415	Catalog, Glossary of Computer Programs and Documentation		
M-3407A	Technical Order		
RELATED DESIGN DOCUMENTS			
R-3527	Systems Security Plan		Development and operation
R-3528	Clandestine Vulnerability Analysis		Requirements
R-3529	System Security Standard		Operational
R-3535	Reliability/Maintainability Allocations Assessment, Analysis		
R-3537A	Reliability/Maintainability Data Reporting and Feedback Failure Reports		
SYSTEMS/SUBSYSTEM ANALYSES			
S-3581	Subsystem Design Analysis Report		(See also S-3619)
S-3582	Subsystem Engineering Development Record		(See also S-3619)
S-3591A	Technical Reports		Requires DDC and Air Univ. Library distribution
S-3604	Functional Flow Diagrams	499A	Requirements derivation
S-3605	Requirements Allocation Sheets	499A	Requirements derivation
S-3606	System/Design Trade Studies	499A	Requirements derivation
S-3607	Schematic Block Diagrams	499A	Requirements derivation
S-3608	Time Line Sheets	499A	Requirements derivation
S-3618	System Engineering Management Plan (SEMP)	499A	Overall management
S-3619	Technical Performance Measurement Report	499A	Per SEMP
S-30567A	Computer Program Dev. Plan (CPDP)	800-14 Vo. II	Recommended for Source Selection
S-30559	Technical Operating Report		No DDC distribution required
TEST			
#	Test and Evaluation Master Plan (TEMP)	AFR 80-14	AFSC Supplement I
T-3701	System Test Plan		Alternative to 3703/3706
T-3703*	Category I Test Plan/Procedures		CPCI, subsystem
T-3706*	Category II Test Plan/Procedures		System level
T-3717*	Category I Test Report		CPCI, subsystem
T-3718	Test Reports - General		Quick Look, Interim, Addendum
T-3719*	Category II Test Report		System level
T-3729	Test Facility Requirements Document		Prior to system testing

* Part of minimum software documentation set.

This data item is not contractor-developed.

sheets, the CDRL should define abbreviations used on the CDRL entry forms, provide instructions for interpreting or completing CDRL entries, and provide mailing addresses for the distribution lists.

CDRL preparation and DID modification are further described in AFSCR 310-1, Management of Contractor Data. This regulation requires justifying the need for each CDRL-defined document, to minimize project cost.

3.4.4.6 Enforcement of Proposed Plans

A SOW provision is necessary to require contractors to comply with plans they generate, such as the Computer Program Development Plan (CPDP). The CDRL should also call for updating each such plan. If delivery of a plan is required as part of the contractor's proposal, the RFP Section C-2 must specify it. Some words of caution are needed. Regardless of who originated the document, if a plan is incorporated in the contract as a compliance document, the plan will normally be construed as a government requirement on the contractor. Therefore, every word must convey the intent of program office personnel, since subsequent changes may impact contract cost, schedule or performance. (See also Section 5.4.1.3.2, below).

3.4.4.7 Data Checklist

A minimum set of recommended data are indicated by asterisks in Table 3-1. In general, the RFP/SOW writing team should be guided by the following considerations in determining data requirements:

1. Does the intended use of data delivered under contract meet one or more of the following purposes:

   - Provide the basis for required decisions.
   - Document technology for future use.
   - Provide for reprocurement or manufacture.
   - For instructional purposes.
   - For logistics support (maintenance, installation, etc.).
   - Record test results.
   - Assess reliability and supportability.
   - Report current status in a timely manner.
   - Operations.

2. Was a data call issued? How were the scope and magnitude of this data call determined?

3. Does the RFP instruct the contractor to price each data item?

4. Are all data items selected to be listed on DD Form 1423 in response to the data call completely justified to the DMO by the originator?

5. Are there duplicate or overlapping requirements?

6. Are distribution lists held to a minimum number of recipients having a positively established requirement for the data item?

7. Is the DD Form 1423 in the RFP file current?

8. Will the contractor format suffice?

9. Have all MIL-Specs, Standards, and DID's been reviewed for possible deletion or tailoring in order to save costs?

3.4.5 Statement of Work Checklist

The following checklist for SOW's provides some of the considerations which the writers must bear in mind.

1. Is the SOW sufficiently specific to permit the writer and the contractor to make a list of manpower and resources needed to accomplish it?

2. Are specific duties of the contractor stated in such a way that he knows what is required and that the contract administration office representative who signs the acceptance report can tell whether the contractor complied?

3. Are sentences written so that there is no question of whether the contractor is to be obligated (that is, "the contractor does this work," not "this work will be required").

4. Is the proper compliance document shown? Is it really pertinent to the task? Is it properly tailored?

5. Are any military specifications or exhibits applicable? In whole or in part? If so, are they properly tailored? (Use the latest available revisions or issue of each document).

6. Is general information separated from direction so that background information, suggested procedures, and the like, are clearly distinguishable from contractor responsibilities?

7. Does the schedule reflect a date for each thing the contractor is to do or deliver? If elapsed time is used, does it specify calendar days or work days?

8. Are proper quantities shown?

9. Have the headings been checked for format and grammatical usage? Are subheadings comparable? Is the text compatible with the title? Is a multidecimal numbering system used or a WBS-consistent system used?

10. Have extraneous material and crossreferences to contract clauses and general provisions been expunged?

11. Does SOW task reference CDRL Data Item(s) generated by the task?

12. Have all extraneous data requirements been eliminated and all tailoring accomplished?

3.4.6 RFP/SOW Reviews

Figure 3-2 depicts in block form the various steps involved in showing the sequence of events in SOW development as they relate to responsible or interested activities. During the development of the specimen SOW, the project officer should ensure adequacy of content through integrated efforts of the members of the SOW writing team. Project officers should ensure that all elements of the program office, staff functional specialists, user agency and other agencies review the SOW to determine that technical and data requirements being procured fulfill a common system objective.

After all comments are incorporated, the SOW writing team then reviews the final document. After compilation of the draft, a coordination cycle is usually necessary to ensure that it is complete and comprehensive. Coordinators are those persons who have a functional or command responsibility. Coordinators should not give general impressions, but should concur or suggest specific changes in the language used. When the coordination cycle is completed and the specific changes have been coordinated and agreed upon, a final draft should be prepared. The final draft should then be given a final review by the program manager to ensure that it accurately reflects program requirements.

Additional reviews and some of the above reviews are done in conjunction with the RFP reviews discussed in Section 5.3.

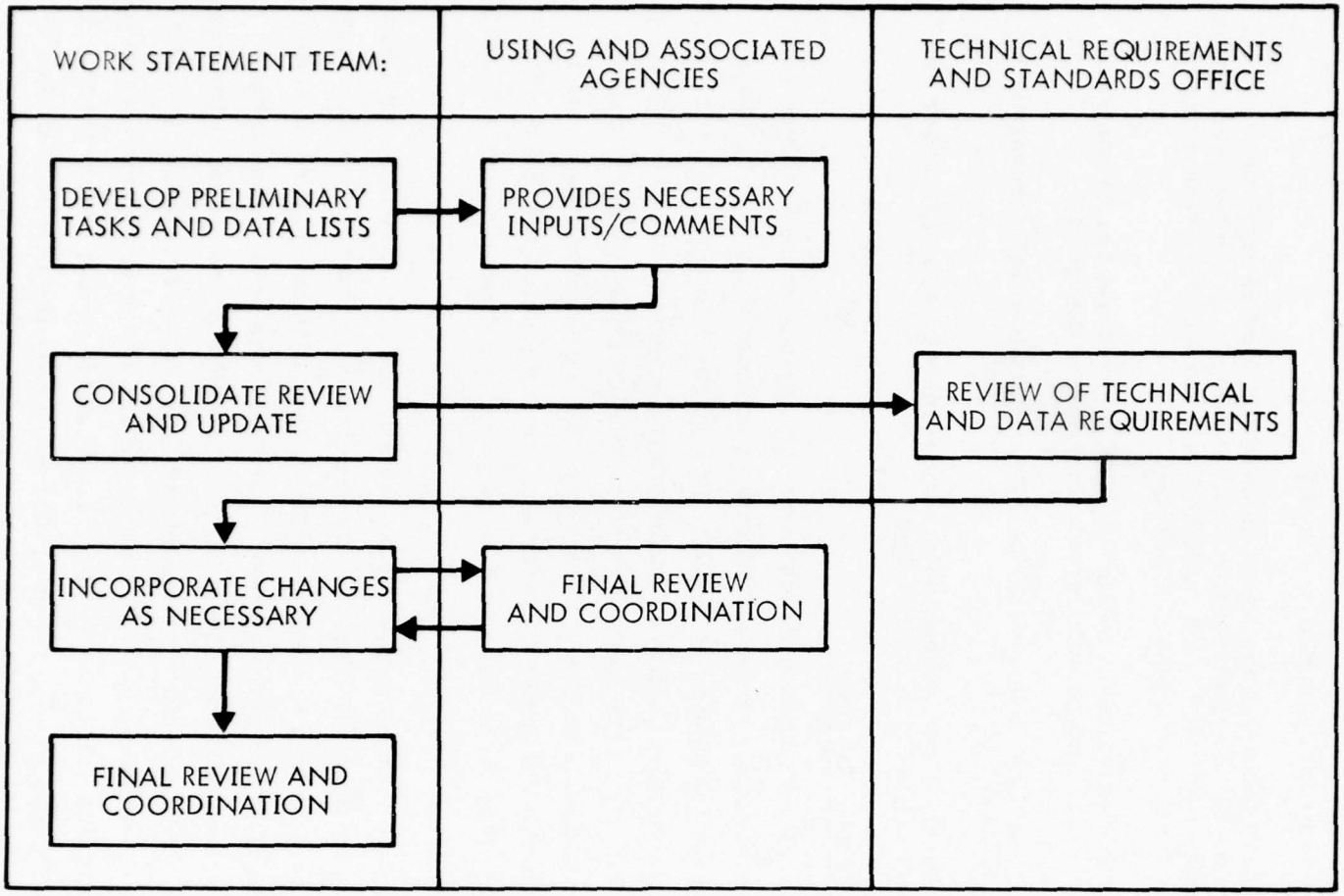

Figure 3-2. Statement of Work Development

4. SOW PHASE AND DISCIPLINE SPECIFIC GUIDELINES

4.1 ACQUISITION LIFE CYCLE

The discussion on the various life cycle phases is based on AFSCP 800-3. The system life cycle consists of phases through which a weapon or support system must go if it is to be delivered to the operational inventory as shown in Figure 4-1. Figure 4-2 shows typical SOW effort in the phases.

Computer program development can be conceptualized as the computer program life cycle shown in Figure 4-1. This cycle may span more than one system acquisition life cycle phase, or occur in any one phase. For example, a mission simulation computer program may undergo all of the phases of the computer program life cycle during the conceptual phase, while a mission application program may undergo these phases during the validation, full-scale development, and production phases. The computer program life cycle, and the formal activities associated with it (configuration management, technical reviews, testing and audits, and so forth), will occur at least once for each CPCI during the system acquisition life cycle. The activities need not be sequential, instead, there are potential loops between all the phases. For example, design may reveal problems in performance and cost which lead to the revision of requirements and reinstitution of certain analyses. Checkout may reveal errors in design, which in turn may lead to redesign or requirements revision. The phases of the computer program life cycle are discussed in the Contracting for Software Acquisition Guidebook in this series.

4.2 TYPES OF SOW TASKS

The matrix provided in Figure 4-3 (Ref. SAMSOP 800-6) depicts the various management/technical disciplines and their applicability to a SOW for specific phases of the system life cycle. The matrix is indicative of the appropriate tasks to be considered for a specific type of procurement. It includes the various program phases defined in AFSCP 800-3 and a breakdown of the various types of efforts for which program offices prepare contract SOW's. (The Software Development column is in the

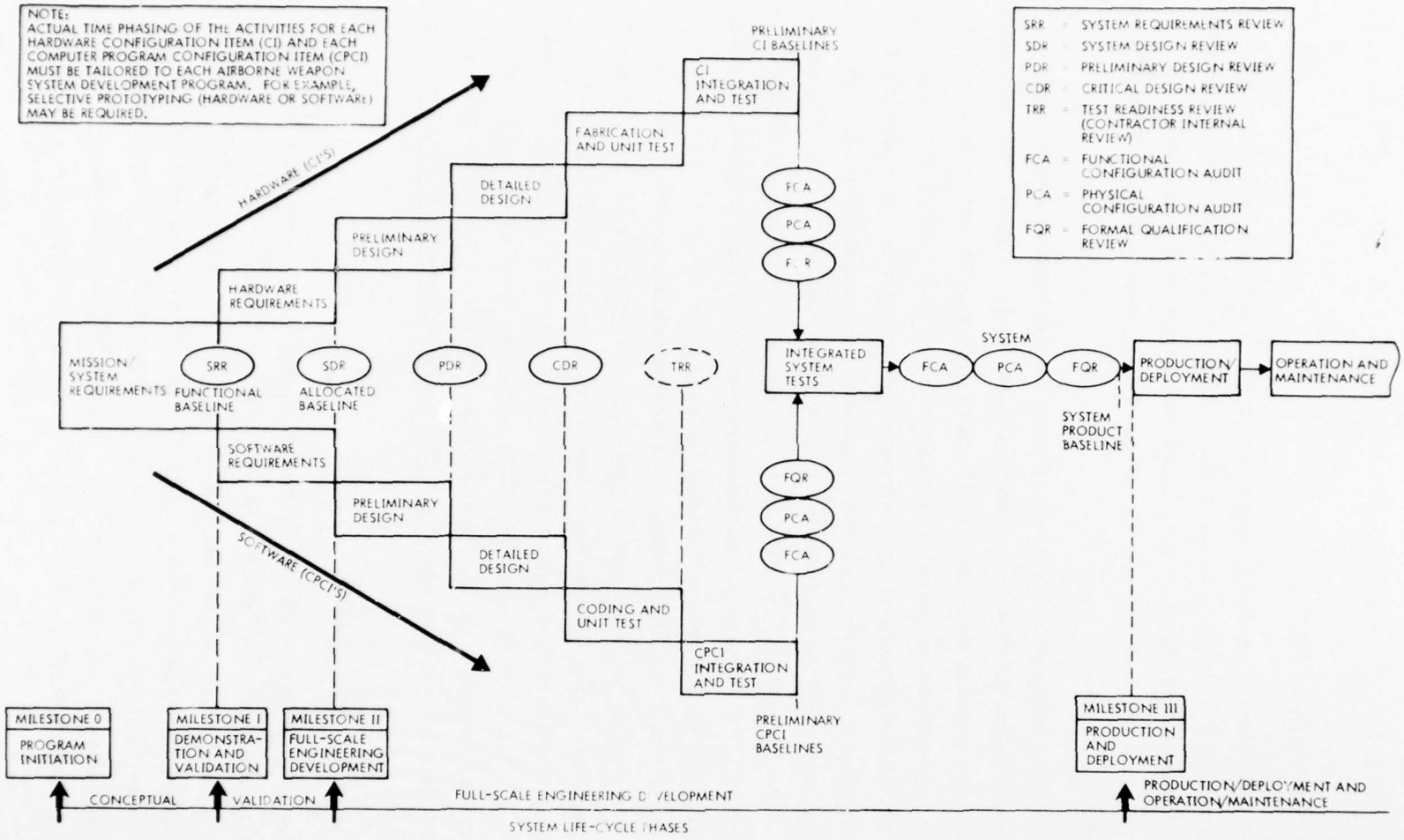

Figure 4-1. Idealized System Life Cycle

CONCEPTUAL PHASE	VALIDATION PHASE			FULL-SCALE ENGINEERING DEVELOPMENT PHASE AND PRODUCTION PHASE
GOVERNMENT EFFORT		CONTRACTOR EFFORT	GOVERNMENT EFFORT	
CONTRACTOR SUPPORT MAY BE NECESSARY FOR SOME AREAS OF THIS PHASE: IF CONTRACT EFFORT IS REQUIRED, PROGRAM OFFICE WILL NORMALLY PREPARE SOW IN COORDINATION WITH SUPPORTING FUNCTIONAL ELEMENTS IN THE DIVISION STAFF. PREPARE INPUTS TO THE DECISION COORDINATING PAPER (DCP), PROGRAM MEMORANDUM, OR OTHER DECISION DOCUMENTS. PREPARE PRELIMINARY SYSTEM SPECIFICATION, TEMP, TEOA	PREPARE RFP'S. PREPARE: (1) SOW FOR VALIDATION PHASE EFFORT INCLUDING DD FORM 1423. (2) SPECIMEN FULL-SCALE DEVELOPMENT PHASE SOW. ISSUE RFP'S. REVIEW AND PROVIDE GUIDANCE TO CONTRACTORS PREPARING FULL-SCALE ENGINEERING DEVELOPMENT SOW'S. UPDATE PRELIMINARY SYSTEM SPECIFICATION. PREPARE PROGRAM MANAGEMENT PLAN.	DEFINE SYSTEM IN ACCORDANCE WITH VALIDATION PHASE SOW. (1) WRITE FULL-SCALE DEVELOPMENT PHASE SOW. (2) SUBMIT TECHNICAL PROPOSAL AND BUDGETARY (FIRM) COST PROPOSAL FOR FULL-SCALE ENGINEERING DEVELOPMENT PHASE. (3) COMPLETE AND UPDATE SYSTEM SPECIFICATION AND GENERATE APPROPRIATE CI SPECIFICATIONS AND CRITICAL ITEM SPECIFICATIONS. UPDATE TEMP	EVALUATE CONTRACTORS' TECHNICAL AND COST PROPOSALS. (1) DETERMINE SOURCE. (2) NEGOTIATE FULL-SCALE ENGINEERING DEVELOPMENT PHASE CONTRACT. (3) AWARD CONTRACT. (4) PREPARE AND SUBMIT UPDATED DCP. (5) VALIDATE ALL SPECIFICATIONS.	REQUIREMENT CHANGES DUE TO PROGRAM REDIRECTION (GOVT). CORRECTION OF DEFICIENCIES (CONTRACTOR).

Figure 4-2. Government-Contractor Statement of Work Effort in the System Life Cycle

	MANAGEMENT/TECHNICAL DISCIPLINE	CONCEPTUAL					DEMONSTRATION AND VALIDATION			FULL-SCALE ENGINEERING DEVELOPMENT			PRODUCTION AND DEPLOYMENT				OPERATIONAL		
		BASIC AND APPLIED RESEARCH	STUDY CONTRACT	SYSTEM PLANNING STUDY	EXPLORATORY DEVELOPMENT	ADVANCED DEVELOPMENT	SYSTEM PROTOTYPE	HARDWARE PROOFING	DEVELOPMENT PROGRAM DEFINITION	ENGINEERING/OPERATIONAL DEVELOPMENT	DEVELOPMENT TESTING AND TEST SUPPORT	SOFTWARE DEVELOPMENT	PRODUCTION	DESIGN CHANGE	FOLLOW-ON PROCUREMENT	SITE ACTIVATION	LAUNCH SERVICES	TECHNICAL SUPPORT SERVICES	MODIFICATION
1	AUDIOVISUAL DOCUMENTATION	-	-	-	-	P	P	P	-	R	R	P	P	-	-	P	-	-	-
2	BIOMEDICAL/ BIOENVIRONMENTAL	P	-	R	P	P	P	P	R	R	R	-	M	P	-	M	P	P	P
3	COMPUTER RESOURCES MANAGEMENT	-	R	-	-	M	R	R	M	M	M	M	-	M	M	-	P	M	M
4	COMSEC/TEMPEST	P	P	M	M	M	M	P	P	M	M	-	P	M	P	P	M	-	R
5	CONFIGURATION MANAGEMENT	-	-	-	P	P	R	R	R	M	M	M	M	M	M	M	-	R	M
6	CONTRACT WORK BREAKDOWN STRUCTURE/CODES	-	-	-	P	P	R	R	R	M	M	R	M	M	M	M	M	M	M
7	CORROSION CONTROL	-	-	-	P	-	M	M	M	M	P	-	M	P	M	P	P	P	M
8	ELECTROMAGNETIC COMPATIBILITY	P	P	R	R	M	M	M	M	M	M	-	M	R	M	M	M	M	M
9	ENVIRONMENTAL PROTECTION	-	P	P	P	P	P	-	P	P	P	-	P	-	-	P	P	P	P
10	FINANCIAL MANAGEMENT REPORTING	P	P	P	P	P	M	M	M	M	M	M	M	M	M	M	M	M	M
11	FREQUENCY MANAGEMENT	-	-	-	P	P	R	R	M	M	M	R	M	M	M	M	M	M	M
12	HUMAN FACTORS	P	P	M	M	M	M	M	M	M	M	P	R	M	R	P	P	P	M
13	INTEGRATED LOGISTICS SUPPORT	-	-	R	R	M	M	M	M	M	P	-	-	M	M	P	-	P	M
14	INTELLIGENCE/THREAT	P	R	M	M	M	M	P	M	M	M	P	-	M	-	-	-	-	P
15	LIFE CYCLE COST/DESIGN TO COST	P	R	M	R	M	M	M	M	M	M	M	M	M	M	-	-	P	M
16	MAINTAINABILITY	P	P	R	R	M	M	M	M	M	M	P	M	M	R	R	P	P	M
17	MANUFACTURING MANAGEMENT	P	-	P	P	M	P	M	P	M	M	-	M	M	M	-	-	-	P
18	NATURAL AEROSPACE ENVIRONMENT	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	NONDESTRUCTIVE INSPECTION	-	-	-	-	P	P	-	R	R	P	-	M	R	M	P	R	R	R
20	PARTS CONTROL AND STANDARDIZATION	P	P	P	P	M	M	M	M	M	-	-	M	M	M	P	-	-	M
21	PERSONNEL AND TRAINING/ TRAINING EQUIPMENT	-	P	P	P	P	R	M	R	M	M	M	M	M	R	P	-	-	R
22	PREOPERATIONAL LOGISTICS SUPPORT	-	-	P	M	M	M	M	M	M	M	-	M	M	M	M	M	M	M
23	QUALITY ASSURANCE	P	-	-	-	R	P	R	R	M	M	M	M	M	M	M	M	M	M
24	RELIABILITY	P	P	R	R	M	M	M	M	M	M	P	M	M	M	R	P	P	M
25	SCIENTIFIC AND TECHNICAL INFORMATION (STINFO)	M	M	M	M	M	M	M	M	P	P	M	P	-	-	-	-	-	-
26	SUPPORT EQUIPMENT	-	P	M	M	M	M	M	M	M	M	M	M	M	M	M	M	-	M
27	SURVIVABILITY/ VULNERABILITY	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
28	SYSTEM ENGINEERING MANAGEMENT	-	P	R	P	P	R	R	R	R	P	R	P	P	-	-	-	-	-
29	SYSTEM PROPELLANTS	-	-	P	P	P	P	P	P	P	P	P	P	P	P	P	M	P	P
30	SYSTEM SAFETY	P	R	R	R	M	M	M	M	M	M	P	M	M	M	M	M	M	M
31	TECHNICAL MANUALS	-	-	-	-	-	-	-	-	P	P	P	M	M	M	M	M	M	M
32	TEST AND EVALUATION	R	P	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
33	TRANSPORTABILITY	-	P	-	P	P	P	R	R	M	M	-	M	M	M	M	P	-	R

LEGEND:

M MANDATORY APPLICATION R RECOMMENDED APPLICATION P POSSIBLE APPLICATION (PROGRAM DEPENDENT)

- NOT APPLICABLE

Figure 4-3. Management/Technical Discipline Application Matrix

Full-Scale Engineering Development Phase columns). This should not be construed to mean that there are no software tasks during the other phases).

Sources of SOW material are Product Division Statement of Work preparation pamphlets, e.g., SAMSOP 800-6, which contains 33 short appendices on different potential SOW tasks, e.g., Computer Resources Management, Configuration Management, Quality Assurance, Test and Evaluation, etc. Each appendix includes basic instructional information for the SOW writer in a standardized format. Previous or similar contracts are an excellent source of task statements. The other guidebooks in this series should also be consulted for definition of specific tasks, e.g., CM, QA, VV&C, etc. However, these tasks should be tailored to specific program objectives, insuring that the task effort includes essential requirements only.

4.3 VARIABLES AFFECTING SOW CONTENT

There are many variables which affect the content of the SOW as discussed below.

4.3.1 Complex Weapon Systems

For a large complex weapon system, all SOW's may be made fairly consistent by the use of standardized paragraph titles and numbers, each with a corresponding preliminary CWBS element. For the standardized paragraphs which do not apply to the specific SOW, the paragraph number may be included with a NOT APPLICABLE for the paragraph title. An SOW paragraph on Compliance Documents, e.g., SOW paragraph 3.1, may be treated in much the same way, i.e., standardized sub-paragraph numbers for particular documents, with NOT APPLICABLE in place of the document reference when appropriate. This standardization is used to improve preparation of the numerous SOW's for the system and coordination of them among the many functional disciplines, especially those with common requirements/tasks in several SOW's.

4.3.2 NSCCA/PATE

Nuclear Safety Crosscheck Analysis (NSCCA) and Performance Analysis and Technical Evaluation (PATE) are performed by a contractor/agency other than the development contractor. PATE is one form of

Independent Verification and Validation (IV&V). NSCCA is accomplished to implement the requirements of AFR 122-9 and AFR 122-10. PATE is accomplished primarily to independently determine that the software met its requirements. The developer's contract should include delivery of the software and sufficient CDRL items to the NSCCA/PATE contractor(s) or to other V&V contractors to enable them to perform the required analyses. See VV&C Guidebook for specific CDRL recommendations.

4.3.3 Systems Engineering Contractors

A systems engineering contractor who supports the Air Force requires delivery of the software and most of the technical CDRL items. Therefore, the deliveries should be reflected in RFP/Contract Section H and the CDRL. SOW paragraph 4.0 (Special Considerations) and an RFP/Contract Special Provision should specify the interrelationship of the contractor with the systems engineering contractor as well as the customer and associate contractors.

4.3.4 Support Software

All software used to support design, development, and test of the operational software should be identified and placed under configuration control. Rights to this software are discussed further in Section 5.4.2.5.3 below. The need for its acquisition is pointed out there. Delivery of that software and its associated documentation required by the using and maintaining agencies should be established in the contract.

5. GUIDELINES FOR RFP PREPARATION

A Request for Proposal (RFP) is a formal document used by the Air Force to solicit proposals from potential contractors for required supplies and services. The RFP must provide an accurate description of what is being bought, what the conditions are for its acquisition, what is desired in proposals, and what the evaluation factors are for competitive awards. Each section of the RFP and all of its attachments and exhibits impose requirements on offerors. All these requirements (except those in Part I of the RFP) are included in the contract. The time and effort invested in producing quality RFP's results in proposals which are more responsive and easier to evaluate. This all helps to assure a good contract. (Section 3 of this guidebook discusses the SOW and related attachments.)

5.1 RESPONSIBILITIES

5.1.1 General Responsibilities

The Procuring Contracting Officer (PCO) generally is responsible for preparing and issuing an RFP with concurrence of the program manager. Technical, financial, logistics, and management experts must actively participate with the PCO in preparing and reviewing the RFP. Final review and editing are accomplished to ensure continuity and consistency and avoid duplication, which are frequent complaints by bidders. Participants preparing the RFP should be familiar with the program guidance in the various program background documents.

5.1.2 Specific Responsibilities

Directorate of Procurement has the basic responsibility for preparation of the formal contract solicitation.

Program/Project Directors prepare and identify SOW's, CDRL, specifications and other compliance documents according to AFR, AFSCR, local regulations and procurement directives and program office direction (e.g., MENS, PMD, PMP, DCP, etc.).

Procuring Contracting Officers (PCO's) with procurement staff support prepare their respective solicitations and contractual documents in compliance with ASPR, ASPR supplements, and local directives.

5.2 RFP ORGANIZATION

AFR 70-15, which explains the Major Defense System Source Selection process for both Validation Phase and FSED Phase competitive contracts, should be reviewed before RFP preparation. The policies and procedures of AFR 70-15 may also be tailored for use in Less-Than-Major System acquisition programs, or AFSCR 80-15 R&D Source Selection Policy and Guidance, may be applied.

RFP organization objectives are to maintain the intent and content of the Uniform Contract Format (UCF)(ASPR 3-501) and to communicate clearly and concisely with potential offerors. These objectives can be accomplished by using all Parts and Sections of the UCF as the same Parts and Sections of the RFP as shown in Figure 5-1.

The UCF and RFP are separated into four parts that group similar documents together. There is no requirement for grouping the Parts of the RFP into specific volumes.

5.2.1 RFP Proposal Preparation Instructions

RFP Part I General Instructions contains Instructions for Proposal Preparation (IFPP) including such information as the name and identification number assigned to the potential contract, the issuing office, and the Government official point of contact for the proposal. It identifies all parts of the RFP, specifies terms for delivery of the proposal, and contains questions to be responded to by each offeror (bidder). It provides guidance as to the type of proposal expected, information to be included, format of the proposal, mechanics of submission, basis for contract award, grounds for rejection, security, proposal size limitations, number of copies required, and the type of contract planned. It also provides the general criteria to be used by the Government to evaluate proposals (including relative importance of technical merit, price, etc.).

UCF AND RFP PART I - GENERAL INSTRUCTIONS

SECTION A - COVER SHEET

SECTION B - CONTRACT FORMS AND REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFEROR OR QUOTER

SECTION C - SOLICITATION INSTRUCTIONS, CONDITIONS, AND NOTICE TO OFFERORS

SECTION D - EVALUATION FACTORS FOR AWARD

UCF AND RFP PART II - THE SCHEDULE

SECTION E - SUPPLIES/SERVICES AND PRICES

SECTION F - DESCRIPTION/SPECIFICATIONS

SECTION G - PRESERVATION/PACKAGING/PACKING

SECTION H - DELIVERIES OR PERFORMANCE

SECTION I - INSPECTION AND ACCEPTANCE

SECTION J - SPECIAL PROVISIONS

SECTION K - CONTRACT ADMINISTRATION DATA

UCF AND RFP PART III - GENERAL PROVISIONS

SECTION L - GENERAL PROVISIONS

UCF AND RFP PART IV - LIST OF DOCUMENTS AND ATTACHMENTS

SECTION M - LIST OF DOCUMENTS,EXHIBITS, AND OTHER ATTACHMENTS

Figure 5-1. RFP Outline in Uniform Contract Format

5.2.2 RFP Model Contract

RFP Part II - The Schedule, Part III - General Provisions, and Part IV - List of Documents and Attachments serve as a Model Contract. They consist of a description of the supplies and services to be provided by the contractor, the Delivery Schedule, the Contract Terms and Conditions, Contract Administration Data and a list of documents and attachments thereto. Basically, the Model Contract is the Government's initial contract proposal. It contains numerous blanks for the offerors to complete and is subject to change during the negotiations that are later conducted with each qualifying offeror.

AFR 70-15 mandates inclusion of a Model Contract in a Validation Phase or Full-Scale Engineering Development Phase RFP. Such inclusion is intended to limit negotiation to possible alteration of specific Model Contract Provisions. Use of a largely standard contract based on the Model Contract can also assure appropriate and consistent contractual provisions governing issues common to many Major Defense System acquisition programs.

5.2.3 RFP Attachments

The RFP attachments normally include the Statement of Work (SOW), Specifications, appropriate Project Summary Work Breakdown Structures (WBS), Preliminary Contract Work Breakdown Structure (CWBS) and their Dictionaries, applicable engineering drawings, DD Form 254 (Contract Security Classification Specification), enforceable contractor-prepared plans, a Contract Data Requirements List (CDRL), and other documents which provide information essential to the particular contract. Copies of modified or Unique Data Item Descriptions (UDID's) referenced in CDRL's will be included in this part as annexes to the CDRL.

5.2.4 RFP Classified Parts

Classified information pertinent to the RFP may be placed in a separate RFP volume, if desired.

5.3 RFP EVENTS AND SCHEDULES

Individuals preparing the RFP should become familiar with the program objectives, direction, and guidance to identify the few truly

firm requirements by reviewing the program background documents, the DCP issues resolved by the Defense System Acquisition Review Council (DSARC) Program Memorandum, the PMD, the PP, the PMP, or other direction and guidance documents. In addition, they should identify goals or desired capabilities and, if feasible, arrange them in order of priority. These should not be confused or intermixed with the firm requirements.

Along with local directives on RFP and SOW preparation, the following documents should also be reviewed before RFP preparation is started.

- AFSCP 800-6, "SOW Preparation Guide"
- AFSCP 70-4, "RFP Preparation Guide"
- AFSCM 173-4, "Program Breakdown Structures and Codes"
- MIL-STD-881A, "Work Breakdown Structures for Defense Materiel Items"
- AFR-310-1, "Management of Contractor Data"
- AFR-800-14, Vol II, "Acquisition and Support Procedures for Computer Resources in Systems"

5.3.1 Planning

Preparing an RFP for a major program can be a lengthy task. Events should be scheduled in advance. Figure 5-2 presents a typical procurement planning schedule requiring over one year to complete.

Since no RFP is self-explanatory, it is advisable to have maximum face-to-face interchange with industry to insure they understand the requirements, constraints, intentions, etc. This makes industry work toward what you really want, encourages more bidders, helps form stronger teams, and gets corporate commitment. It also helps industry believe you really want comments on DRFP's, not just cosmetic motherhood.

At the optional meeting with industry in Figure 5-2, the system level requirements should be explained with the issuance of a first cut system specification. This meeting may also be used to discuss lower

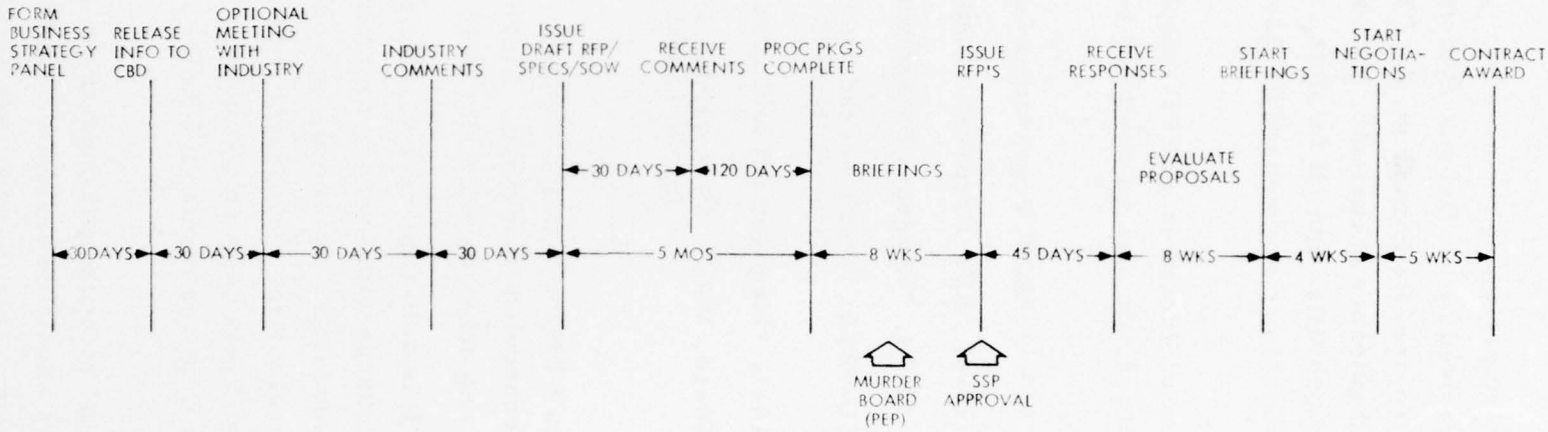

Figure 5-2. Typical Procurement Planning Schedule

specifications, SOW, data requirements, logistics, etc. This meeting with industry gives industry an extra look at requirements and a chance to see how you incorporated their comments in the draft RFP. The Program Office can also take advantage of the informal discourse with industry at these early stages to build a better acquisition.

5.3.2 Draft Requests for Proposals

AFR's 70-15 and 800-25 require that solicitations on procurements, that have the potential for significant industry cost reductions, provide for feedback from prospective contractors regarding performance, schedules and/or other contractual requirements which, if changed, would reduce needless cost and/or improve the acquisition. AFR 70-15 contains procedures to be followed on major system acquisitions. AFSC and local ASPR Supplements contain procedures for acquiring industry feedback on other draft solicitations. The DRFP review by industry may be solicited before receipt of a formally approved Secretarial D&F and may be effected either in full with a draft of the complete solicitation or in part with a draft of one or more sections of the RFP. Partial release of the DRFP (for example, only the Statement of Work, specifications, standards, CDRL, and RFP Sections C and D) can be accomplished while other portions of the solicitation are being prepared to minimize and avoid the loss of procurement leadtime. The DRFP is accompanied by an Executive Summary letter and contains the elements prescribed in AFSC ASPR Sup 3-550 (c) 2.

5.3.3 Procurement Evaluation Panels

AFSCR 70-7 requires the use of procurement evaluation panels (called Murder Boards) on selected major procurements to evaluate the completeness, clarity, and accuracy of solicitations before their release to industry. Specifically, panel review is required for programs on which the Secretary of the Air Force is the source selection authority (AFR's 70-15 and 800-2), other major, high-interest programs, and, by local directive, to lesser programs. The value of procurement

evaluation panels has been demonstrated by the measurable improvement in the quality of RFP's. Field command panel reviews assist greatly in improving the quality of RFP's.

5.3.4 Other RFP Reviews

Other commands and agencies participating in the program (ATC, AFLC, Using Command) should be contacted to obtain "sign-off" on their requirements. If the above Procurement Evaluation Panel (AFSCR 70-7, Murder Board) is used, participation by these other commands and agencies provides an excellent vehicle for this step. The evaluation provides a final opportunity to ensure compliance with current procurement policy, to review technical requirements, and to ensure RFP language reflects program objectives.

The Technical Requirements and Standards Group provides certification that the final SOW has been reviewed by interested offices of primary/functional responsibility and is proper for inclusion in the contract.

Staff offices, such as the procurement committee and judge advocate, review the RFP package to ensure compliance with current regulations, policy and directives.

Where system source selection procedures are to be used, the Source Selection Board should also review and approve RFP package. This review can elicit suggestions for improvements which may avoid costly and time-consuming problems during source selection and contract negotiations.

5.4 PRODUCING THE RFP

For competitive procurements the buying offices:

1. Prepare RFP's IAW ASPR 3-500 and AFR 70-15 and supplements and ASPR requirements. Since each procurement has characteristics of its own which warrant treatment of RFP provisions different from any other RFP, no sample solicitation is provided. Each specific procurement will have unique Sections C&D although form and format will normally be standardized locally. Sections C-2 and D apply only to competitive procurements.

2. Forward each competitive RFP to the prospective offerors under a brief and concise "Executive Management Summary" letter. Representative contents for this letter are provided in AFSCP 70-4, Section 3-10. It is signed by the program director/project manager, the PCO or higher level depending on program importance. This letter provides industry and government top management with a summary of the salient features of the procurement.

For follow-on and single source procurements the buying offices:

1. Tailor the letter of transmittal to the specific requirement instead of forwarding the RFP as in (2) above.

2. Provide, where necessary, proposal preparation instructions similar to that specified in 5.4.1.3.2 below.

3. Adhere to guidance contained in 5.4.2 below.

5.4.1 RFP Part I - General Instructions

Instructions for Proposal Preparation (IFPP) are contained in UCF Part I - General Instructions, Sections A through D. Each of these sections is covered below.

5.4.1.1 Section A - Cover Sheet (DD Form 1707)

This RFP section, corresponding to UCF Section A, contains information such as the name and identification number assigned to the potential contract, the issuing Government office, and the Government's official point of contact with bidders.

This section also contains a separate table of contents for Parts I through IV of the RFP.

5.4.1.2 Section B - Contract Forms and Representations, Certification and Other Statements of Offerors

This RFP section, corresponding to UCF Section B, consists principally of the Solicitation, Offer and Award (Standard Form 33) plus supplementary material. It identifies all parts of the RFP, specifies terms for delivery of the proposal, and contains a number of questions pertinent to the Source-Selection to be answered by each bidder.

There are no software representations or certifications required or recommended in ASPR. However, certain AFSC product divisions have required offerors to certify whether or not they have developed, generated, delivered or are obligated to deliver the same or substantially the same computer software included in their offer.

5.4.1.3 Section C - Solicitation Instructions and Conditions, and Notices to Offerors and Proposal Preparation Instructions

This RFP section is comprised of ASPR Standard Form 33A plus supplementary material prescribed in ASPR 3-501(b) Section C and ASPR 9-202.2. It corresponds to UCF Section C.

5.4.1.3.1 Section C-1 - Instructions and Conditions, and Notices to Offerors. Typical software related clauses for inclusion in this section are:

1. "Identification of Restricted Rights Computer Software" provision in 7-2003.76 to be inserted in accordance with ASPR 9-603(b). (Ref. ASPR 3-501(b) Section C (liv)).

2. Some provision for predetermination of rights in technical data and computer software (Ref. ASPR 9-202.2(d) Note that no ASPR provision exists for this important solicitation task. AFSC ASPR Sup 7-2003.61 contains a provision which, if tailored for a particular solicitation, is a step in the right direction. However, particular care and effort should be taken in coordination with legal, procurement and technical personnel to insure that appropriate rights in critical software or technical data (or options for those rights) are obtained. This can only be accomplished if time is taken to draft an RFP provision and to include an implementing agreement in the resulting contract. (See AFR 800-14 Vol. 1, AFSC Sup 1).

5.4.1.3.2 Section C-2 - Proposal Preparation Instruction. This section provides specific guidance on proposal preparation (technical, management, and cost/price proposals and format). By including instructions in this section, the RFP preparation team will insure that offerors will place appropriate emphasis on software development and management. Instructions should touch on such areas as configuration management, data management, cost management and software development (e.g., analysis, design, code and checkout, debug and levels of test and integration) for operational and support software.

RFP's should require offerors to submit a great deal of this information formatted as a Computer Program Development Plan (CPDP) (See AFR 800-14, Vol II, paragraph 3-9 and DI-S-30567A) that is tailored to specific requirements of the acquisition.) The CPDP can be the initial submittal of a CDRL requirement that will be subsequently updated once on contract.

The RFP should identify any non-obvious technical risks. Bidders should also be asked to identify critical factors in their proposals. Currently, the following are likely to be among the set of high-risk software capabilities:

1. Certifiably correct control of access to data of different security classifications and in different "need to know" categories;

2. Automatic detection and correct reporting of equipment and software errors;

3. Automatic reconfiguration and recovery of the system from errors, including transition to and from degraded modes of operation;

4. Single point failure elimination;

5. Reaction time to threats;

6. Redundancy for critical mission functions;

7. Radiation hardening methods;

8. Multi-mission design.

5.4.1.4 Section D - Evaluation Factors for Award

This RFP section, corresponding to UCF Section D, should state in general terms the criteria the Government plans to use to evaluate the proposals, and the relative importance of each aspect of the proposal (e.g., cost, technical, management). The evaluation criteria should include consideration of critical factors and of high-risk proposal provisions.

The RFP should also state the importance to evaluation of factors extraneous to the proposal itself, e.g., exceptions to the terms and conditions of the RFP, alternatives to the government's requirements, energy conservation, other salient factors.

Neither the detailed evaluation criteria to be applied by the SSEB, nor the exact weights to be attached to each criterion by the SSAC should be revealed to bidders. Nevertheless, the RFP's evaluation criteria should be as informative as possible, in order to elicit the best possible proposals, to minimize misunderstandings, and to avoid claims by losing bidders that their proposals were treated unfairly. The guidebook in this series on Contracting for Software Acquisition discusses detailed evaluation criteria.

5.4.2 RFP Parts II-IV - Model Contract

RFP Part II - The Schedule, Part III - General Provisions, and Part IV - List of Documents and Attachments serve as a Model Contract in the RFP. RFP Parts II, III, and IV consist of UCF Sections E through K, L, and M, respectively, as shown in Figure 5-1. Subsequent subsections discuss those software-related items relevant to preparation of these RFP parts. Review of ASPR 3-501, and of an actual contract for a Major Defense System or a Segment of one, is recommended prior to RFP preparation.

5.4.2.1 Section E - Supplies/Services, and Prices

This section of the Model Contract part of the RFP (UCF Section E) lists the major groups of supplies and services to be provided under the contract. Each such group is termed a Contract Line Item (CLI) and is represented by a unique Contract Line Item Number (CLIN) (e.g., 0001, 0002). Some Contract Line Items are broken down into major parts called Subline Items, each with a sub-CLIN (e.g., 0002AA, 0002AB), the latter clearly related to those of the Contract Line Items to which they belong. Section E includes a quantity, and or cost and fee for cost reimbursable contracts or a target price for each sub-CLIN and for each CLIN that has no sub-CLIN. The prices, or costs and fees, agreed on during negotiation become part of the negotiated contract's Section E. Each CLIN should correspond to some SOW paragraph(s) and some Preliminary CWBS Element(s) (see Section 3.4.2). ASPR's 3-501 and 20-300 apply. A CLI should be included to refer to the CDRL (i.e., the deliverable technical data) (ASPR 3-501(b) Section E).

5.4.2.1.1 Software CI Version Definition. Define a separate (or sub CLIN) for each version of a software CI where different delivery/acceptance requirements apply. Include instructions in the Delivery Schedule (see Section 5.4.2.3 below) prescribing the number of versions of each software CI and the terms of these versions' delivery during a single Period of Performance. Insure requirements for delivery to IV&V contractor, government, etc. are included as necessary.

5.4.2.1.2 Dual Identification of Software. Besides identification as a CLIN, each deliverable software CI must also be represented by a DD Form 1423 entry (ASPR 9-603(a) and AFSC supplement). This requirement is meant to satisfy an ASPR definition of software as data. A special annex or attachment should be setup for this purpose. It should contain a separate DD1423 entry for each deliverable CPCI. Each such entry must reference the contract schedule for delivery requirements. Cost for each entry will be levied against the applicable CLIN. Note that CPCI documentation will not be included in the Special Annex/Attachment. It should be included in the CDRL with all other technical data. See Section 3.4.4.2 for an explanation of this treatment.

5.4.2.2 Section F - Description/Specifications and Section G - Packaging and Marking

RFP Section F of the Model Contract is not used when a SOW is included as an attachment to the RFP and is incorporated in Section E of the contract by reference. Use this section only when warranted. ASPR 3-501 recommends its use when Section E is not in sufficient detail to describe the CLI's. Basic guidance on content is contained in ASPR 1-1200.

5.4.2.3 Section H - Deliveries or Performance

This section of the Model Contract part of the RFP (UCF Section H) prescribes for each CLIN a desired delivery date or Period of Performance. Section H is often called the Delivery Schedule. The Delivery Schedule can be a major item during negotiation and will become contractually binding on the winning bidder. Therefore realistic schedules for the software development should be included here.

A Period of Performance can be defined to begin or to end either at a fixed date or relative to the completion of some other CLIN's Period of Performance or delivery date. Similarly, its duration can either be fixed (e.g., six months) or can depend on other CLIN's. All relative dates, however, must be related to a fixed calendar date.

Groups of supplies and services wanted at different times should normally be defined as separate CLIN's (or Sub-CLIN's) in Section E of the RFP (see Section 5.4.2.1 above). To avoid possible inconsistency, SOW definitions of tasks should reference the Delivery Schedule rather than incorporate delivery dates and Periods of Performance.

5.4.2.4 Section I - Inspection and Acceptance

This section of the Model Contract part of the RFP (UCF Section I) should include the place of inspection and place of acceptance of the CLIN's. (ASPR 14-300).

5.4.2.5 Section J - Special Provisions

This section of the Model Contract part of the RFP (UCF Section J) typically contains miscellaneous definitions, clarifications, and other items that would fit poorly elsewhere. Among the most important provisions typically incorporated are: definition of the type of contract (e.g., CPIF, CPFF), incentive arrangements, contractor use of GFP, definition of relationships among Government participants and contractors, and data rights agreements. If any of these topics is fully covered by a standard clause, it will be treated under General Provisions (see Section 5.4.2.7 below) instead of Special Provisions.

5.4.2.5.1 GFP. The GFP provisions should identify all items of GFP (including Government-furnished software or computer time) to be used by the contractor as development aids or with which equipment or software to be developed under the contract must interface. The GFP provisions should also specify the pertinent documentation to be made available and state when, where and under what conditions the contractor can use each GFP item. For example, a Government-owned operating system would normally be listed among the GFP with which contractor-developed application software would interface, unless the acquisition

included development of the operating system. Great care should be taken to identify GFP precisely, and to define correctly the RFP's interfaces with equipment or software to be developed under the contract. Otherwise, the errors and omissions in GFP definition may be cause for an equitable adjustment in the price, terms or conditions of the contract.

5.4.2.5.2 Working Relationships. If the acquisition involves two or more contractors who must interface their products or tasks, the Special Provisions should define their working relationships. Similarly, if Government contract management includes an SE/TD contractor or independent V&V contractor/agency, these require special definitions in the Special Provisions which should specify the relationships including subcontractors as well. Finally, if the contract involves subcontracting, the Special Provisions should direct Government visibility (vs. control) into the subcontractors' activities. For example, the Special Provisions should insure that prime contractors notify the Government of important subcontractor meetings, (e.g., PDR's, CDR's). They should grant the Government the right to attend all such meetings. They may also specify direct subcontractor delivery to the Government of copies of all subcontractor-produced documents deliverable to the prime contractor.

5.4.2.5.3 Government Rights to Data. Inadequate provisions for Government rights to software and technical data produced under a contract have caused trouble and expense in several acquisitions. As a rule, the contract should grant the Government sufficient rights (or options for rights) in software and technical data developed, generated, used or delivered under the contract to insure its ability to operate, test, and maintain the system as planned and as offered by the contractor.

In order to do this, every effort should be made to predetermine rights to technical data and computer software prior to contract award or early enough to insure satisfactory resolution that performance will not be inhibited. The agreement should pertain to technical data and computer software that will be developed, generated, used, modified or deliverable under the contract and that is necessary to operate, test and maintain the system as planned and as offered by the contractor. It should require: 1) identification of the data and software, 2) statement

of a price to obtain unlimited rights or a license, if either is offered, 3) the time required for delivery if optioned, 4) the current status of the Governments's rights (e.g., limited rights, restricted rights, license, none) and 5) that, if the identified list changes during the performance of the contract, the PCO must be promptly notified and the predetermination updated if deemed appropriate.

It may also be advisable to obtain an agreement whereby the prime contractor will provide technical assistance to make the software, procured under the Predetermination Agreement, work at other facilities where computers, processes, etc. are different, causing the software not to work. The government, however, must bear the cost of the technical assistance, if the option is exercised.

5.4.2.6 Section K - Contract Administration Data

This section is identified in the RFP in order to form the basis for insertion of the proper information in the resulting contract.

5.4.2.7 Section L - General Provisions

This section of the Model Contract part of the RFP (UCF Section L) typically lists the standard ASPR contract clauses incorporated by reference in the Model Contract, e.g., 7-104.9(a) and (b) "Rights in Technical Data and Computer Software" and 7-104.9(m) "Deferred Ordering of Technical Data or Computer Software". The General Provisions may also include other Departmental, Command or local standard clauses, e.g., Restrictions on Printing, Release of Information, as required.

5.4.2.8 Section M - List of Documents, Exhibits, and Other Attachments

This section of the Model Contract Part of the RFP is a list of attached documents and references which should include as a minimum the SOW, the CDRL, and DD Form 254 (Contract Security Classification Specification) but may also include the specifications, the appropriate Project Summary WBS or Summary PBS, the Preliminary CWBS, their Dictionaries, any applicable Engineering Drawings, and any other documents that provide background information essential to the particular contract, See ASPR 3-501 for guidance.

As a rule, the list should include every document, incorporated by reference in the Model Contract, which a bidder may be presumed not to possess. Whenever the RFP omits such a document, bidders should be given rapid access to it on request, subject to compliance with security regulations.

5.4.3 RFP Attachments

Sections 5.4.3.1 - 5.4.3.5 respectively, discuss the Specifications, Engineering Drawings, DD Form 254, WBS, and CDRL.

5.4.3.1 The Specifications

The Specifications define the system and its parts. Thus, the Specifications are an essential part of an RFP for a contract that includes software development, since the effort contracted for is best defined relative to Specification provisions.

A RFP may include software-related specifications of several levels and types, depending on the contractual approach, on the acquisition Life Cycle Phase, and on the types of work and product being contracted for. See Table 1-1. These different kinds of specifications are discussed in the Documentation Guidebook in this series.

The RFP for a Conceptual Phase contract to define a Major Defense System cannot normally include a System Specification since an Initial System Specification is the usual product of such a contract. However, the RFP should incorporate any documents that prescribe system requirements or suggest potentially feasible designs, as direction to or guidance for the contractor. Such documents include any appropriate ROC, plus specifications for analogous systems, for interfacing systems, and for any subsystems that the system to be defined must incorporate.

In contrast, an RFP for a contract to provide deliverable, end product software during any single phase of the overall weapon system development, even conceptual phase, should definitely include either:

1. Provisions for a contractual milestone, such as a software PDR, at which to authenticate the contractor-developed specification, or
2. The specification itself.

A Validation Phase contract RFP should include the Initial System Specification, augmented by any other documents that modify the system's requirements. In particular, the Specifications should include specifications of interfacing systems and of any subsystems whose inclusion in the planned system is directed.

The RFP(s) for Full-Scale Engineering Development contracts should include a subset of the Allocated Baseline developed during the Validation Phase. This subset should comprise the Authenticated System Specification; any appropriate Segment Specification, a Computer Program Development Specification for each software CPCI to be developed under the contract, and appropriate specifications for the software CPCI's, any other Segments, and any other systems, with which the software to be developed under the contract must interface.

Software-related Production Phase and Deployment Phase RFP's should each incorporate the latest approved versions of each of the System Specifications, any relevant Segment Specifications, all software CPCI Development and Product Sepcifications, and analogous equipment specifications, pertinent to the Software maintenance, modification, or related development planned.

One General policy is recommended: don't allow substantial software development effort to commence without sufficient, clear, Development Specifications that incorporate a complete and validated requirements set. Whenever such specifications are missing, incomplete, internally inconsistent, in conflict with other known requirements, or inadequately validated, software development is premature. Before a software development contract is let, further effort (perhaps itself contracted for) should rectify the deficiencies, possibly even if schedules thereby slip. Failure to follow the recommended procedure has led to an inefficient software development process that sometimes has caused serious cost overruns and schedule slips in the systems that included this software. The costs of sound specification are usually repaid with interest in problems avoided later.

5.4.2.3 Engineering Drawings

These typically describe equipment (e.g., a computer-to-computer interface) or a vehicle (e.g., vehicle equipment layout, a computer installation). Such Engineering Drawings may be necessary for the development of software that must interface with such equipment or the persons operating it.

5.4.3.3 Contract Security Classification Specification

This, consisting of DD Form 254 plus possible attachments, states the security requirements applicable to the contract. For example, it prescribes the level(s) of security clearance required of contractor personnel working on the contract and the criteria for classifying contract generated information.

5.4.3.4 Work Breakdown Structure (WBS)

MIL-STD-881A prescribes preparation of several types of WBS during planning for acquisition of Major Defense Systems and many less-than-major systems. AFSCM 173-4, Program Breakdown Structure and Codes, supports MIL-STD-881A for programs managed by AFSC.

Section 3.4.2 above discusses the WBS in detail. The Project Summary WBS, the CWBS, and their Dictionaries may be attachments to the RFP.

5.4.3.5 CDRL

The CDRL defines the documentation and the software storage media deliverable under the contract. These are termed Data Items. All instances of each Data Item are defined in a sequence-numbered CDRL entry. Section 3.4.4 above discusses the CDRL preparation in detail.

5.4.4 Classified Parts of the RFP

Any classified attachments, or other classified provisions of the RFP, may be contained in a separate volume and referenced from their usual places. For example, this volume might contain a classified threat model.

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